U.S. Department of Agriculture
Forest Service Research Note SE-304 February 1981

NEW PLASTIC APRON-GUTTER FOR GUM COLLECTION

by
Ralph W. Clements[1]
and
H. Grady Williams[2]

ABSTRACT.—A one-piece polyethylene apron-gutter has been developed and marketed to complement the plastic cup. The plastic system eliminates contamination from iron cups and gutters which have reduced gum grades for 70 years. Sulfuric acid will not attack the plastic apron-gutters, and the new system should prove durable for at least 4 years of continuous use.

Keywords: Plastic apron-gutters and cups, contaminants, gum grades, naval stores.

Gum flows from the pine tree clean and pure. Reduction in grades and loss in value at the market are caused primarily by contamination from iron cups, gutters, and aprons which have been used by the industry to collect gum since about 1910. Iron cups and gutters deteriorate rapidly when sulfuric acid is used to stimulate gum flow, and about 99 percent of the timber worked for gum production in the United States is treated with sulfuric acid. Most of the contamination can be prevented by collecting gum with plastic cups and gutters. A satisfactory, commercially available plastic system is described here.

Gum producers receive the highest dollar value for gum that will produce WATERWHITE and WINDOWGLASS grades of rosin. The presence of increasing amounts of iron lowers the grade to NANCY, MARY, and a very dark KATE. Iron contaminants increase the ash content or rosin, and only a small amount of iron rust from cups or gutters will lower the quality by three grades. Market prices spiral downward with each drop in grade.

Since 1972, the Gum Naval Stores Production Unit of the Southeastern Forest Experiment Station at Olustee, Florida, has been devoting considerable research to the problem of iron contaminants. A new plastic cup of tough and durable high-density polyethylene was developed and introduced to the industry in 1977.[3] Producers who have purchased these plastic cups report better grades and higher prices.

To complement the plastic cup and complete the improved collection system, studies were initiated in 1977 by the U.S. Forest Service to develop plastic gutters and aprons. Drawing heavily upon the cooperation and expertise of the Georgia Forestry Commission, Macon, Georgia, the experiments of the two agencies led to the design described and illustrated here.

ONE-PIECE PLASTIC APRON-GUTTER

The new unit is made of polyethylene plastic and functions as both apron and gutter, balancing the cup and channeling the gum into the cup. The apron-gutter is designed to fit trees as small as 9 inches d.b.h., and face widths up to 12 inches can be

[1]Naval Stores Research Specialist (Retired), Southeastern Forest Experiment Station, Olustee, Florida.

[2]Naval Stores Forester, Georgia Forestry Commision, Helena, Georgia.

[3]Clements, Ralph W. 1977. New plastic cup for the gum naval stores industry. USDA For. Serv. Res. Note SE-258, 4 p. Southeast. For. Exp. Stn., Asheville, N.C.

obtained. The outer ends of the one-piece unit contain a cap that provides rigidity to the outer lips and prevents gum from backing off the ends as waste.

Sulfuric acid, in paste or solution, will not corrode or damage the polyethylene unit. The plastic is relatively tough, and with normal use and abuse in the woods the new gutter should have a lifespan of at least 4 years.

INSTALLATION AND USE

A notch in the outer lip of the apron section enables the gutter to be flexed to fit any tree 9 inches or larger in diameter. Normally, five double-headed nails will attach the gutter firmly to the tree if the bark has been properly smoothed and prepared. Correct positioning of the nails and installation are shown in figures 1 and 2.

Figure 1.—The plastic, one-piece apron-gutter installed on a tree 16 inches in diameter. Drive the center nail first, then the two nails in each wing. If needed to obtain a tight and leakproof fit on irregularly shaped trees, use additional nails.

On some trees with flat and irregular surfaces, a tight and leakproof fit can be obtained by slightly twisting the outer ends of the gutter toward the tree before nailing on the shoulders. The versatile apron-gutter can be shaped to fit tightly on almost any cylindrical surface because the plastic is flexible, even in cold weather.

Figure 2.—The plastic cup should fit snugly under the apron section to prevent tilting when filled with gum. If the bark has been properly removed and prepared, a 30-penny nail will hold the cup under the apron-gutter.

The new plastic cup and apron-gutter system can be elevated like the standard iron system. However, double-headed nails can be driven completely through the plastic material by heavy-handed and careless workers.

AVAILABILITY

The new plastic apron-gutter presented herein is commercially available, and some 36,000 molded gutters were installed in 1980 by selected gum producers in Mississippi, Alabama, Georgia, and Florida. Their reports will help evaluate performance and durability of the plastic units. The one-piece apron-gutter costs a few cents more than the comparable metal system, but the plastic will enable the producer to receive top grades and higher market prices for the life of the system.

Gum producers will find that the new plastic gutters are tough, easy to install, and acid resistant. With reasonable care, the plastic apron-gutter should last longer than the two-piece iron system. Most important, there will be no iron contaminants in the gum from the collection system to lower grades.